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ABSTRACT

A comparison of the relative efficiency of grading systems can be based on three criteria: accuracy, familiarity, and simplicity. It is suggested that a letter grade system should replace the numerical system in India. In terms of the "accuracy" criteria, the numerical marking system provides a very inaccurate measurement of academic achievement, given that the standards of examiners differ widely and that scales across subjects also differ. The numerical system is more familiar to Indian educators and students, but is misleading, implying a precision seldom attainable. The real meaning of one student's mark is only relative to other student's marks. The misconception about numerical marking offsets the advantage of familiarity in favor of grades; the marking system is too simple, at the expense of other standards of scalability, reliability, etc. To address the question of how to award, interpret, and add grades, a standard scale needs to be adopted across subjects. The examiner would decide the relative merits of a student's performance, and the university would assign grades. Grades can be assigned by converting marks into grades or on an absolute standard. Other objections to both systems are raised. Several appendices are attached concerning grading scales. (PJM)

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# Monograph on Grading for Universities

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## PREFACE TO REVISED THIRD EDITION

The Research Cell of the Association of Indian Universities came up with a "Monograph on Grading for Universities" mainly based on two papers presented by the Project Officer, Prof. V. Natarajan at the Fourth and concluding Workshop on Grading at the University of Madras on Dec. 22-23, 1975. The Monograph was released during the Annual Meeting of the Association held between Jan. 8-11, 1976 at Sri Venkateswara University, Tirupati.

Monographs are usually intended

(a) to share the ideas with other researchers concerned to generate more thinking in this area

(b) to acquaint educational workers such as educational administrators, curriculum planners and teacher educators with the tentative findings of the explorative study

(c) to obtain, if possible, their comments and criticisms for the benefit of the project

(adopted from M. Dori-o-Carelli, Director, Unesco Institute of Education, Hamburg, 1973 VIE Monographs I)

If we accept the above it can be said with pride that this Monograph has served almost every purpose listed. Both the first and the second editions were received well. It is now possible to revise the Monograph incorporating some useful suggestions and make it still more useful. A method of grading restructured question papers of universities is added as Appendix F. Appendix G is a design of a facing sheet of an answer book. Appendix J gives a summary of recommendations made and accepted by universities.

It is hoped that this revised third edition will be found more useful and acceptable to educational administrators, curriculum planners, teacher educators and importantly teachers of universities.

New Delhi
Jan. 1, 1977

V. Natarajan
Project Officer (Examinations)

# MONOGRAPH ON GRADING FOR UNIVERSITIES

## INTRODUCTION

In the marking system that obtains in Indian undergraduate university examination using numerical marks, students are marked on each examination paper on a scale from 0 to 100, though the full scale is seldom used. Every student's obtained mark is supposed to be a measure of the quality of his answers. At the same time, a student's marks on different papers are combined to give his aggregate mark for all of his subjects. Very often an evaluation (as distinct from a measurement) is applied to the aggregate mark. If this aggregate is as high as 60% (very often this) of the possible total, the student is said to be in the first division ; otherwise his mark is in the second or third division or he has failed.

The suggestion that we should replace this system with the grade system[1] is based on a number of important considerations and valid citeria.

1 University Grants Comission, Examination Reform—A plan of action, May 1973, pp 3-4.

Some of these are :

(a) *Accuracy*. The result—percent mark or grade—should indicate as accurately as possible the level of academic achievement of the students who are marked.

(b) *Familiarity*. The meaning of the marks or grades should be clear, to students and to others who are concerned about their standing. (These others include teachers, parents and those who may make decisions about a student's eligibility for employment or for postgraduate study.)

(c) *Simplicity*. It should be reasonably easy to calculate the marks or grades without a need to use expensive equipment or elaborate statistical procedures.

Let us try to evaluate the marking system on these criteria.

## 1.1 Accuracy

The numerical marking system provides a very inaccurate measurement of academic achievement. A few of the reasons why this is so can be given now.

1. The standards of examiners differ widely. The experience of examiners would tell that this is very likely. Research proves that it is a fact, that judgements of examiners are signficantly different when they are marking equivalent sets of answer books and even when different equally competent examiners have marked the same individual answer book.[2]

2. Harper, A. E. Jr. "Ninety Marking Ten—A study of examinations". Indian Educational Review, Vol. 2, 1967, pp 26-41.
Taylor, H.J. "An Examination of Examiners". Journal of Education and Psychology, Vol. 21, 1963, pp. 15-25.
Natarajan, V. "Reliable Marking of Tutorial, Laboratory Work and Drawing of Polytechnic Students". Journal of Nachimuthu Polytechnic, 1975 (under publication).
Natarajan, V. "An Exercise in Marking". Workshop on Evaluation for College Teachers, 1975, AIACHE.

Surely, we want a student's mark to depend on the quality of his answer rather than on which examiner happened to mark his answers. If we want to persist with the numerical marking system and still want to realise this goal we would have to scale the marks of examiners to a common standard. Scaling can be done in a variety of ways some of which are shown in Appendix A. Those that are worthy of consideration in this regard are what are familiarly known as Gauhati method[3] and Dandekar method.[4] An alternative will be to award grades rather than numerical marks.

3. Taylor, H. J. "Operation Passmark". Gauhati University, 1963. Misra, V. S. "A Study of the Effect of Randimisation and Scaling on the Errors in Examination Marks", Guahati University, 1969.

4. Dandekar, V.M. "Statistical Reform of the system of Evaluating Results of Mass Conducted Examinations". Indian Educational Review, Vol 3, 1968, pp 1-19.
Natarajan, V. "Evaluation of Examination Scores". Technical Teacher, Madras, 1973.

2. Examiners very frequently decide who should pass and who should fail. If the passing mark is 35, they give an unusual number of 35 and very few (perhaps not any) marks of 34 or 33. Similar "bunching" may be found at the minimum marks for first and second divisions. But this is in

dulging in evaluation when they are only required to measure the examinee's performance. There is a distortion of results here, which can be avoided in the grading system.

3. It is a matter of common experience that in some subjects like Mathematics, the highest mark awarded may be 100 and the lowest 0 or close to 0. In many other subjects, this never happens. The highest mark for instance may be 70 and the lowest mark 20. Thus for what is considered to be a 100 mark paper, the actual range of marks is only 50. When the marks of different papers are added, the subject in which a wide range of marks is used has a disproportionate effect on the total result. For example, we combine marks in two subjects say Chemistry and Mathematics; if marks in Chemistry range from 30 to 60 while marks in Mathematics vary from 5 to 95, the result will be that Mathematics will receive three times the weight of Chemistry. In effect, we shall be evaluating the performance of the student on his Mathematics rather than his Chemistry.

This certainly leads to a great deal of irrationality, in the choice of subjects or of papers and in regard to the time given by a student to the study of particular subjects or papers. ★Such irrationality can be obviated by scaling the marks to a common standard, but the better alternative is to use grades in the place of marks.[6] Summing up, the consideration of accuracy of the result will lead us to award grades rather than numerical marks.

6 University Grants Commission. Recommendations of Zonal Workshops on Examination Reform, a follow up study of the Plan of Action, 1975, pp 6-7

**1.2 Familiarity**

In terms of this, much can be said in favour of the percent numerical marking system. Ruch[7] criticises the numerical marking system on the ground that it implies a precision that is seldom attainable. Hill[8] observes:

7 Ruch, G.M. the Objective or New Type Examination, Chicago, Scott and Forman Co.

8 Hill, W.H. "Marking, Scaling and Grading." Improvement of Examinations, University of Calicut, 1972, Chap. 10.

★ Students are therefore tempted to choose subjects more from the criterion of the easiness with which they can obtain a first class their from the Criterion of their aptitudes.

"The present percent marking system is familiar to teachers, students, employersand the public ; and all of them think they knowWhatit means ; the trouble is that too much of what they know is not true. The marking scale is highly misleading. Marks are not, though they appear to be, awarded on an absolute scale ; for there is no absolute scale."

The numerical marking system is looked upon as a fixed and dependable standard, which it is not. Suppose three students obtain 60, 59 and 55 marks respectively in a particular paper. Everyone of us is bound to interpret that the one who obtained 60 marks is better than the one who got 59 but certainly much better than the third who got 55. The university goes so far as to place one of these in the first division and the other two in the second. Thers are two major assumptions here : (1) The marking scale is absolute ; and (2) the marks are free of error. Neither of these is justified.

A student's mark has a real meaning only as a number to compare with numbers assigned to other students. These numbers are only *estimates* and they are subject to considerable error. Appendix B gives different sources of error in our examination.

Taylor, after making calculations for many university examinations, has said that for examinations in India, this probable error in marking is normally about 5 and often as high as 7. The UGC reports in "Examination Reform—A Plan of Action, 1973" that "for some typical papers set at universities, experts have carried out a statistical analysis. Such a statistical analysis has shown that when an examiner assigns a mark to a script, there is a 50% chance that his error is greater than 5%. This means that where a candidate is awarded a raw mark of 41, the true mark may be either above 46 or below 36 in 50% of the cases. Under these circumstances, the 101 point scale where candidates are distinguished in steps of one mark, loose all its significance." If then we consider our three students whose marks are 60, 59 and 55, for one who got 59 his true mark should be between 55 and 65 and that range includes the true marks of all three students.

Since the advantage of familiarity is offset by serious misconceptions in the case of numerical marks, we must go in favour of grades.

## 1.3 Simplicity

The present marking system is very simple, so simple that the marks of examiners are used for comparison when they are not comparable : they are not scaled, which they should be; raw scores in different subjects are added, which they should not be. This indeed is simplicity at the expense of all other standards.

In university examinations scaling of marks should have been adopted. Some pioneers have done this (Gauhati). Instead of depending too much on human labour (to again make it simple), some of the work of recording, checking, tabulating and scaling could be done by machine, and in India, such equipment is available with universities.

If we adopt a sound grading system in the place of marks, most of the things mentioned above are taken care of. But then the question comes up how to award grades, interpret grades and add grades. To answer this, we have to look at two distinct things namely. (1) a technical proposal for awarding grades to answer papers and (2) intoducing grading, its problems and solutions.

## 2.0 From Marks To Grades

Very often it happens that one examiner marks his papers from a high mark of 80 to a low mark of 30 while another marks his from 60 to 20—such a difference is quite common and it is unfair to students. The unfairness would be eliminated if the marks were scaled to a common standard. The difference between one examiner's 80 and the other's 60 would then become immaterial. They *would agree in this that these are the best papers and that is exactly what we need to know.* The function of marks is to determine the rank order of the students. This therefore is the function of the examiner too, this and no other.

In a university setup, the examiner in a particular subject paper would be limited to determining the relative quality of answers, to deciding how the student's papers should be ranked in order of merit. *He should leave for the university to decide the final mark for the student as well as the question whether he should be considered passed or failed*

It is not at all proposed that we should abandon marks as such. Marks are useful, but they are misused. Numerical marks can be the beginning of the marking procedure : they should not at all be the end. The scientific and practical way to look at it is, that examiners should mark papers just as they have been doing but then the final report of the results should not be in the form of numerical marks. There are several procedures. One such would be somewhat like this :

Answer books that are to be marked should througnly be randomised. This will ensure that all examiners will be marking sets of answer books that are equivalent in quality. Each examiner has both good and bad ones and each set (or bundle) is no better or worse than any other. In such a case, we can be reasonably sure that differences in the marks of examiners may be attributed to their different standards of marking, not to differences in the abilities of students. Also the identity of the student and of his college should be removed from each answer book.

After the examiners have assigned the marks the university does the scaling, and thence grading. Appendix C gives different types of grading systems. The Dandekar method is recommended, since it is felt that this method of scaling can lead directly to a system of grading.

Dandekar has given the normal distribution of the range of marks amongst the population, but the distribution of marks as given by the examiners is usually not normal and often far from being normal. He therefore, feels that the frequency distribution of marks in the earlier years is better than applying the normal distribution. The simplest and most direct description of a pattern of distribution is to Indicate the number or the proportion of candidates who have secured marks between certain ranges.

The second column (percentage of candidates) represents a decision that the entire range of marks shall be divided into 7 groups and that each group shall contain the indicated percentage of students. The third column (range of marks) is determined empirically. It is based on the actual marks awarded in the particular subject in the last 3 years (a period of 4 or even 5 years also can be considered)

Awarding Grades

Consider the following table :

| S. No. | Percentage of candidates | Range of marks | Letter grade | Description | Point |
|---|---|---|---|---|---|
| 1. | 3% | 79 and above | O | Outstanding | 6 |
| 2. | 7% | 73-78 | A | Very good | 5 |
| 3. | 22% | 65-72 | B | Good | 4 |
| 4. | 36% | 53-64 | C | Average | 3 |
| 5. | 22% | 40-52 | D | Below average | 2 |
| 6. | 7% | 32-39 | E | Poor | 1 |
| 7. | 3% | <30 | F | Very poor | 0 |

The way the second and third columns are arrived at for this particular subject is something like this: The answer books for each year are arranged in the rank order of their marks, from highest to lowest and a tabulation of marks for each year is made, as in the following table. The table concerns a subject "Compulsory essay in philosophy" for M.A. degree examination (max. marks=200) for the years 1973, 1974 and 1975. The distributions for the 3 years are combined in the last column to form the standard scale.

| S. No. | Letter grade | Percentage of candidates | 1975 | 1974 | 1973 | Average range of marks |
|---|---|---|---|---|---|---|
| 1. | O | 3% | 113-123 | 104-117 | 111-113 | 109-118 |
| 2. | A | 7% | 98-112 | 93-103 | 100-105 | 97-108 |
| 3. | B | 22% | 93-97 | 87-92 | 89-99 | 89-96 |
| 4. | C | 36% | 80-92 | 78-86 | 74-88 | 77-88 |
| 5. | D | 22% | 73-79 | 70-77 | 65-73 | 68-76 |
| 6. | E | 7% | 58-63 | 66-69 | 48-63 | 54-67 |
| 7. | F | 3% | <53 | <60 | <48 | <49 |

The standard scale thus arrived at for a second subject like "Monetary and international economics" for M.Com. degree (max. marks=200) may look like this.

| S. No. | Percentage of candidates | Range of marks | Letter grade |
|---|---|---|---|
| 1. | 3% | 114 and above | O |
| 2. | 7% | 109-113 | A |
| 3. | 22% | 100-108 | B |
| 4. | 36% | 85-99 | C |
| 5. | 22% | 65-84 | D |
| 6. | 7% | 44-64 | E |
| 7. | 3% | <43 | F |

These tables can be prepared one for each subject, and become the standard for the subject. Appendix D gives samples of normative standard tables prepared with the results of postgraduate examinations, M.A./M.Com. M.Sc., of the University of Madras. (The Research Cell acknowledges with grat-ful thanks the authorities of the University of Madras for making available examination results during and immediately after the Workshop on Grading (December 22, 23, 1975).

This table, it should be noted, need not concern the examiners. They only mark the papers as they choose and return them to the university. If the last examination the examiners marked was in 1975, they would be required to mark the 1976 examination in the same way as they were doing earlier. The university arranges the returned papers in rank order and then re-marks them to fit the standard scale. The normative table for the particular subject would be used to convert the marks of students into grades, with the result that a uniform standard of marking is applied to all examinees. The disparate standards of examiners would not effect them.

The normative standard should be kept updated by revising it each year, adding the latest year's marks and discarding those of the earliest

year. This would keep the standard scale always based on data for the latest 3 year period. It is recommended that the percentages in the second column be maintained; the range of marks would differ according to subjects. This table is very close to the one developed by Barrow.[9]

9. Barrow, A.E.T. Examinations in Higher Education, Inter University Board of India (now Association of Indian Universities), 1971, pp 127-39.

Letter grades would thus be the symbols to be used in announcing examination results. These grades would be assigned for each paper in the examination.

The overall grades are needed if we wish to combine the grades for different papers. Assuming that there are 8 papers for the course each carrying 100 marks and that the grades obtained by a student are O, A, A, B, A, B,A, B in different papers, the grade point average of the student, according to our 7 point scale, would be

$$\frac{6+5+5+4+5+4+5+4}{8} = \frac{38}{8} = 4.75 \rightarrow A$$

If each of these papers is weighted in the order of, say 4, 2, 1, 4, 2, 2, 4, 4, the grade point would be calculated as under.

$6 \times 4 = 24$
$5 \times 2 = 10$
$5 \times 1 = 5$
$4 \times 4 = 16$
$5 \times 2 = 10$
$4 \times 2 = 8$
$5 \times 4 = 20$
$4 \times 4 = 16$
$109$

$$\text{Grade point average} = \frac{\text{Total grade points}}{\text{Sum of weights}}$$

$$= \frac{109}{4+2+1+4+2+2+4+4} = \frac{109}{23} = 4.74 \rightarrow A$$

The table below gives a sample of grade point average calculation in three subjects, Mathematics, Physics and Chemistry.

| | Mathematics | | Physics | | | | Chemistry | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Written | | Theory | | Practical | | Theory | | Practical | |
| | External | Internal | Internal | Exam. | Internal | Exam | Internal | Exam. | Internal | Exam. |
| Marks allotted | 60 | 40 | 25 | 75 | 40 | 10 | 25 | 75 | 40 | 10 |
| Weights | 12 | 8 | 5 | 15 | 8 | 2 | 5 | 15 | 8 | 2 |
| Grade obtained By a student | A | B | A | A | A | C | D | C | C | A |
| Points | 5 | 4 | 5 | * | 5 | 3 | 2 | 3 | 3 | 5 |
| | 12×5 | 8×4 | 5×5 | 15×5 | 8×5 | 2×3 | 5×2 | 15×3 | 8×3 | 2×5 |
| | =60 | =32 | =25 | =75 | =40 | =6 | =10 | =45 | =24 | 10 |

Grade point average =327/80 =4.09 →B

*Courtesy of Dr. Edwin Harper, Director, Bureau of Educational Research, Ewing Christian college, Allahabad.

### 3.5 Assigning Grades

Grades can be assigned in one or the other of the two ways:

1. By converting marks into grades: In this procedure various heads of essessment are decided and marks are allotted. A student's work is assessed on individual heads of assessment, total marks found out, and then converted into grades. For example in a theoretical assignment, the heads and marks are:

| Quality | Speed | Method | Accuracy | |
|---|---|---|---|---|
| 4 | 3 | 6 | 7 | out of 20 |
| A student's work may obtain | | | | |
| 3 | 2 | 4 | 3 | out of 20 |
| | | | | This is B grade. |

2. On absolute standard: Standardised and graded projects, assignments and these are collected and studied. If a new project,

assignment or thesis is to be assessed a comparison is made of this with the graded ones and grade decided on this basis.

4.0 GRADING VS. MARKING

It may be relevant here to further elaborate on the advantages that grading gives as compared to the marking system.

At present, different universities adopt different cut-off points for award of divisions/classes and the minimum pass percentages in different subjects are on an absolute rather than a relative scale. The tables below show the variation in classes/divisions as also in minimum pass percentages amongst different universities in different first degree/postgraduate degree courses.

**Variation in Marks for I, II, and III Class and Pass of Different Indian Universities in undergraduate Examinations**

| S. N6. | Name of University | B.A. | | | | B.Sc. | | | | B.Com, | | | | B.E. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1. | University of Allahabad | 60 | 45 | 33 | 33 | 60 | 48 | 33 | 33 | 60 | 48 | 33 | 33 | 65 | 50 | — | 50A |
| 2. | Andhra University | 60 | 50 | 35 | 35* | 60 | 50 | 35 | 35* | 60 | 50 | 35 | 35* | 70D 60 | below 60 | — | 40 50Pr,S |
| 3. | Annamalai University | 75 D 60 | 50 | 40 | 40 | 75 D 60 | 50 | 40 | 40 | 75D 60 | 50 | 40 | 40 | 75D 65 | 50 | — | 50 |
| 4. | Banaras Hindu University | 60 | 48 | 36 Pc | 25Pc | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 25 | — | — | — | — |
| 5. | Bangalore University | 60 | 50 | 40 | 35 40A | 60 | 50 | 40 | 35 40 A | 60 | 50 | 40 | 35 40A | 60 | 50 | 40 | 35 40A |
| 6. | Berhampur University | 50 D | Others | — | 33⅓ 36A | 50 D | Others | — | 30 T 36 A 40 P | 50D | Others | — | 33⅓ 36A | — | — | — | — |
| 7. | Bhagalpur University | 60 | 45 | 33 | 30T 33A | 60 | 45 | 33 | 30 T 33 A | 60 | 45 | 33 | 33 | — | — | — | — |
| 8. | University of Burdwan | 50 D | — | 35 | 33 | 50 D | — | 35 | 30 T 33 40 | 50D Maths | — | 35 | ** | 65‡ | 50 | — | 40T 50S |
| 9. | University of Calcutta | 50 D | — | 34 | 34 | 50 D | ... | 34 | 34 Pr | 50D | — | 34 | 34 | 67 | 50 | — | 50 |
| 10. | University of Delhi | 60 | 50 | 36 | 36 | 60 | 50 | 36 | 33 | 60 | 50 | 36 | 33S | 75D 60 | 50 | — | 50 |
| 11. | University of Gorakhpur | 60 | 48 | 33 | 33 | 60 | 48 | 33 | 25GH 33 | 60 | 48 | 36 | 36 | 70H 65 | 50 | — | 30T,Pr 50Cw,P |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12. | Gujarat University | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 36 | 60 | 48 | Others | 36 | 60 | 45 | — | 33<br>45A |
| 13. | Gauhati University | 50 D | — | — | 33 T<br>33 E, GrA<br>40 P, GrB | 50 D | — | — | 30T<br>33M<br>40Pr | 55D | — | — | — | 65 | 60 | — | — |
| 14. | Karnatak University | 70 D<br>60 | 50 | 35 | 25<br>35 A | 70D<br>60 | 50 | 35 | 35 | 70D<br>60 | 50 | 35 | 35 | 60 | 45 | — | 40T<br>50PrS* |
| 15. | Kurukshetra University | 60 | 50 | 35 | 35 A | 60 | 50 | below<br>50 | 35 | 60 | 50 | below<br>50 | 35 | 70H | below<br>60 | —<br>— | 33HS<br>40PrW<br>50A<br>60SW |
| 16. | Meerut University | 60 | 48 | 33 | 20 | 60 | 48 | 33 | 20 | 60 | 48 | 33 | 20 | — | — | — | — |
| 17. | University of Poona | 60 | 45 | 35 | 35 | 60 | 45 | — | 35 | 60 | 50 | 40 | 35 | 66D<br>60 | 50 | 40 | 40 |
| 18. | University of Rajasthan | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 36 | 60 | 50 | 45 | 33 |
| 19. | Shivaji University | 70 D<br>60 H | 45 H | 35 | 35 | 70Ps, D<br>50Ss, D<br>60Ps<br>48Ss | 45Ps<br>40Ss | 35 | 35 | 70D<br>60H | 45H | 35 | 35 | 66D<br>60 | 50 | 45 | 25<br>40 A |

* Candidates are required to obtain a special minimum of 30% in written and practical part separately in each subject where a practical test is held.

** 30% in the Group I, II and III and 33% in each of the remaining groups.

D=Distinction S=Subsidiary Subjects T=Theory CW=Course Work Hs=Humanities subjects E=English
H=Honours GH=General Hindi P=Project W=Written Sw=Sessional work Gr=Group
A=Aggregate Pr=Practical S*=Sessionals Ps=Principal subjects M=Mathematics
Ss=Subsidiary Subjects Pc=Pass course

Source : Association of Indian Universities, New Delhi. *Universities Handbook India* 1975.

**Variation In Marks For I, II and III Class and Pass of Different Indian Universities in Postgraduate Examinations**

| S. No. | Name of University | M.A. | | | | M.Sc. | | | | M.Com | | | | M.E. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age | First Class | Second Class | Third Class | Pass %age |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 1. | Agra University | 60 | 48 | 36 | — | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 30<br>VV | — | — | — | — |
| 2. | Aligarh Muslim University | 60 | 50 | 40 | 40 | 60 | 50 | 40 | 40 | 60 | 50 | 40 | 40 | 65 | 50 | — | 50 |
| 3. | University of Allahabad | 60 | 48 | 36 | 36A | 60 | 48 | 36 | 36A | 60 | 48 | 36 | 36 | 75H<br>65 | 60 | — | — |
| 4. | Andhra University | 60 | 50 | 40 | 30 | 60 | 50 | — | 40 | 60 | 50 | 40 | 35 | 60 | below<br>60 | —<br>— | —<br>— |
| 5. | Annamalai University | 60 | 45 | — | 45 | 60 | 50 | — | 45<br>Maths<br>50 | 60 | 45 | — | 45 | 75D<br>65 | 50 | — | 50 |
| 6. | Banaras Hindu University | 60 | 48 | 36 | 25 | 60 | 48 | 36 | 25 | 60 | 48 | 36 | 36 | 65 | 50 | — | 40<br>50<br>Pr,<br>VV |
| 7. | Bangalore University | 60 | 50 | — | 35<br>50A | 60 | 50 | — | 35<br>50A | 60 | 50 | — | 35<br>50A | 60 | 50 | 40 | — |
| 8. | University of Baroda | 70 D<br>60 | 50 | 40 | 30 | 70D<br>60 | 50 | 40 | 40 | 70D<br>60 | 50 | 40 | 25<br>VV<br>30T | 70D<br>60 | 50 | — | 40T<br>50<br>Os |
| 9. | Bhopal University | 60 | 48 | 36 | 20 | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 20 | 70 | 50 | — | 50A |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10. | University of Bombay | 60M<br>66Os<br>68Pl<br>30Sl | 50M<br>50Os<br>55Pl<br>30Sr | — | * | 60 | 50 | — | * | 60 | 50 | — | 30<br>40A | 70D | — | — | 45<br>50A |
| 11. | University of Burdwan | 60 | 40 | — | 40A | 60 | 40 | — | 40 Pr, | 60 | 40 | — | 40A | Divisions not awarded | | | 50T<br>60<br>Th, VV |
| 12. | University of Delhi | 60 | 50 | 40 | 25 | 60 | 50 | 40 | 40A,pr | 60 | 50 | 40 | 25<br>40A | — | — | — | — |
| 13. | University of Gorakhpur | 60 | 48 | 36 | 36 | 60 | 48 | 36 | 36 | 60 | 48 | 33 | 33 | — | — | — | — |
| 14. | University of Gauhati | 60 | 45 | — | — | 60 | 45 | — | — | 60 | 45 | — | — | — | — | — | — |
| 15. | University of Jabalpur | 60 | 48 | 36 | 33 | 60 | 48 | 36 | 33 | 60 | 48 | 36 | 33 | 70 | 50 | — | 50 |
| 16. | University of Jammu | 60 | 50 | Below 50 | 33<br>40A | 60 | 50 | Below 50 | 33<br>Pr, T<br>40A | 60 | 50 | Below 50 | 33<br>40A | — | — | — | — |
| 17. | University of Jodhpur | 60 | 48 | 36 | 25<br>36A | 60 | 48 | 36 | 25<br>36A | 60 | 48 | 36 | 25<br>36A | 75H<br>65 | 50 | — | 35T<br>50<br>CW, S |
| 18. | Karnatak University | 70D<br>60 | 50 | 40 | 40A | 70D<br>60 | 50 | 40 | 40A | 70<br>60 | 50 | 40 | 40A | — | — | — | — |
| 19. | Madurai University | 60 | 50 | — | 50 | 60 | 50 | — | 50 | 65 | 45 | — | 40<br>45A | 65 | 40 | — | 40 |
| 20. | Meerut University | 60 | 48 | 36 | 20 | 60 | 48 | 36 | 20 | 60 | 48 | 36 | 20 | — | — | — | — |
| 21. | Patna University | 60 | 45 | 35 | 35 | 60 | 45 | 35 | 35 | 60 | 45 | 35 | 35 | — | — | — | — |
| 22. | University of Poona | 60 | 50 | 40 | 40 | 60 | 50 | — | 25<br>40A | 65 | 50 | 40 | 40 | 70D<br>60 | 50 | — | 50 |

*Different contributions for pass %age.

VV = Viva Voce
H = Honours
A = Aggregate
D = Distinction
Pr = Practical
T = Theory
Th = Thesis
Pl = Principal language
CW = Course Work
S = Seminar
Os = Other Subjects
Sl = Subsidiary language

Source : Association of Indian Universities, New Delhi. *Universities Handbook: India* 1975

Evaluation, which is mainly judgement based on measurement, is different in universities in the same subject at the same level. Such an evaluation is not uniform especially when the numerical marking scale is adopted. If all the universities, on the other hand, agree to adopt say the 7 point grading scale, and also establish relationships between various grades and their meanings in qualitative terms, then there is better uniformity in evaluation. A very good performance in a particular subject will receive an A in all universities, and one who has got an A in a subject will everywhere be considered to have done very well in that subject. In this grading system, there are 7 categories of performance : outstanding, very good, good, average, below average, poor and very poor. No classes or divisions are given, but only letters O,A,B,C,D,E and F. If teachers/ examiners are able to adopt "direct grading", then there is better uniformity amongst universities. In the interim period, when marks are converted into grades in different universities, it is felt that there will be variation in the range of marks for any one particular grade amongst universities. This will not however be a wide variation.

ii. The marking system does not use the full range of marks 0 to 100 everywhere. A range of 20 to 55 is very common in History, Commerce or Psychology etc. The highest mark obtained by an outstanding student in Mathematics is nearly 100 ; an equally outstanding student of History gets somewhere say 58 which is not a first class mark since very often 60% and above is our *arbitrary* first class. So it happens that in certain subjects, students cannot get a first class however outstanding their performance may be.

A comparability amongst disciplines like Mathematics and History can however be ensured if letter grade of outstanding (O) isawarded to top Mathematics students as well as to the top History students. Such comparability will bring a perspective among students which is lacking now. More and more of better students take up Mathematics, physical sciences not because they particularly have aptitudes but because it will be possible to get first classes in these subjects. The lopsided marks have come to be accepted as defining everything, even intellectual superiority, so that students of Mathematics, physical sciences etc. look down upon students of History, Commerce or Psychology and the like.

Even within the same discipline, there may be different subjects with different maximum marks. Different ranges of marks in these subjects are used with the result that even though all the subject papers are supposed to carry a maximum of 100, in practice the weightage given to these subject papers are not equal but different A subject paper in which a wide range of marks is used, will carry greater weightage than the subject which uses a narrow range of marks. For example let there be two papers in Chemistry papers I and II, each carrying 100 marks. Suppose Chemistry I has a range of marks from 30 to 60 while Chemistry II has a range from 5 to 95, the result will be that Chemistry II will have three times the weight of Chemistry I even though our original intention was that Chemistry I and Chemistry II should have equal weights. Students tend to choose papers in which it will be possible to obtain first class marks no matter whether they have the aptitude for them or not. This has certainly led to a great deal of irrationality in the choice of subjects or papers and in regard to the time given by a student to the study of particular subjects or papers.

Grading system when introduced, *will take the emphasis away from marks*. It will ensure great comparability of different subjects in the same discipline.

iii. A student's choice of subjects must be based purely on his aptitude and he should be assured that he will be given a first class if he is really at the top, no matter what subject he chooses. From a student's viewpoint, it has always been better to take a B.Sc. first class in a subject like Mathematics, physical sciences rather than a B.A. or B.Com. with a second or third class in humanities/social sciences, leading to incoherence in the choice of subjects.

Under the system of grading, there is the definite chance of getting an O, the outstanding performance whatever the discipline. The choice of disciplines and subjects by students will be more likely to happen with their aptitude and ability.

iv. It is easily appreciated that if all Indian universities adopt the same grading system (7 point scale) and interpret in the same way, then students can easily move from one university to another within a State or from one State to another. This is advisable and also desirable from the point of view of national integration.

v. There ,is no reason, other than tradition, for a paper to continue to carry 100 marks. Yet paper setters often feel constrained to maintain the accustomed pattern even though it may not be appropriate for a new kind of paper. When universities/examination boards reconstruct their question paper with more variety and larger number of questions, they will find it difficult to maintain the traditional pattern of marks In grading, the maximum marks or mean mark is not itself important. The function of marks is to lead to the rank order of the students and on this rank order, grades can be based.

vi. Where teachers employing many procedures for evaluating achievement (tests, oral recitation, project work, theses, laboratory practical work, written assignments) must report on overall assessment, grading scores over marking. Various heads of assessment and relative marks on these can be alloted, as shown above, and student's work assessed on these : total marks obtained are converted into grades. A better procedure would be grading on absolute standard by comparing the student's assignment, projects or thesis with graded assignments, projects and theses already available. But this requires that teachers and examiners be experienced and collect differently graded assignments, projects or theses.

vii. Especially in essay type examinations, the error of measurement in terms of marks renders it difficult to make fine distinctions. A range of marks has better meaning than individual marks. If even after scaling, an appreciable amount of error still remains, only grading can solve the problem.

viii. In marking, it is usually not possible to give along with raw marks such other details, like mean, standard deviation, reliability coefficient and standard error of measurement. Where this can be done, there is no need for grades.

## SOME APPREHENSIONS AND PERTINENT QUERIES

1. Should not students be marked on an absolute scale rather than on this vague grading system?

Such a question assumes that the marking system is absolute. When a student obtain a mark of 57 in a subject we tend to look at 57 as absolute measure of his ability. It is common experience and well

established by research (quoted earlier) that another equally competent examiner (very often the same examiner again) will award a mark to the same student different from 57. This variation is found to be very often 5 and sometimes as much as 7 for university examinations in our country. There are many reasons for this lack of reliability. But the fact is that there is inconsistency and that marks obtained by students have no absoluteness about them. We cannot for instance attach to marks the same kind of absoluteness that we do to 57 cm length. But this is what we have been traditionally doing. If only we as examiners have ever tried to probe a little further into analysing marks obtained by a group of students with a view to get quantities like mean, standard deviation, reliability, standard error. etc., we would be convinced that the percentile marking system is quite unsatisfactory and there is no absoluteness of marks.

Another concrete argument is, 35 marks in a subject this year is not comparable with 35 of last year or 35 of next year. No university has evidence that a mark of 35 on this year's examination is equivalent to last year's 35. The University is not justified and is deceiving itself when it declares that any fixed number of marks is required for passing an examination. 35 in one subject does not measure up to the same as 35 in another.

In fact, the university departs at times from its own standards. If too few students pass, the marks are moderated which is a pretence that the passing mark has retained its sanctity. It should not have had the sanctity in the first place. The University would do better to admit that the proportion of students who pass is a more stable base for judgement than is a required minimum pass marks.

If grading seems to be vague, it is because it does not presume to fix precisely at which notch of the intellectual scale a student belongs. Grading definitely recognises that there are different sources of error (Appendix B) in mental measurements ; these errors exist even in purely objective forms. Therefore it is more meaningful to say that there is a *band* of achievement rather than a single absolute mark.

2. There is nothing wrong with our marking system ; it has worked well all these years. Is it wise to change this accepted and familiar marking system for something new?

These are two things inherent in such statements, firstly that the precent making system is familiar, secondly it is simple. Most of us think that the present percent marking is familiar to teachers, students, employers and the public, who think they know what the system means; the trouble is that too much of what they know is not true. The marking scale is highly misleading. Marks are not, though they appear to be, awarded on an absolute scale : for there is no absolute scale. This familiar system is looked upon as a fixed and dependable standard which it is not.

The system has been so simplified that we have been traditionally doing things which we cannot justify.

i. We compare the marks of examiners when they are not comparable.

ii. The marks by different examiners are not scaled, which they should be.

iii Raw marks in different subjects are added, which they should not be.

To retain the marking system just because it is familiar and simple, would be, therefore, only seeking convenience at the cost of losing sight of its purpose.

3. Are grades relative ? Relative to what ?

We have to recognise and accept that grades are relative. The question then is relative to what ? relative to a "reasonable expectation" of how well students ought to perform on an examination ? who judges as to what is reasonable ? We know that those who actually do the judging (examiners) do not agree.

The best answer is to say that students should be judged in relation to their peers. In the last 3 years (4 or 5 sometimes), many hundreds of students have written the examination and the standard is based on the performance of this large number of students. There is very little difference in the ability of such large groups from year to year. This is a dependable standard, it has a high degree of stability.

4. Some educationists think that grades are very coarse and they are made as an excuse to persist with high degree of subjectivity in judgement.

Subjectivity in judgement has been found to be more severe in marking than grading. A study by the author[10] has proved that

[10] "On the reliable marking of tutorial, lab work and drawing work of Polytechnic students". Journal of Nachimuthu Polytechnic, Pollachy, S. India

there is lesser variation in grades awarded by various examiners than in the marks awarded by them. This means that grading (by virtue of a range of marks) takes this into account; so to say the grading system lives with the error recognising its presence. The more unreliable the examination is (characterised by long, vague, open, stereotyped questions) the more will be the error and a grading system for this situation will be coarse. Consistent with this, distinction made out by grades is more meaningful and realistic. While marks are inconsistent, grades are realistically consistent. Let us be honest; if there is a high degree of subjectivity, and consequently low reliability, in marking the standard error will be high and a grading system to recognise this, will be coarse.

In the ultimate analysis, what is more important is to devise more and more objective ways of assessing student performance (improving our questions to make them capable of being reliably marked).

5. There is possibility of error in the grading scale.

It may be that with fewer categories (7 vs. 101) we will not make as many errors, but the ones we make may be more serious. There will be border line cases What about the one who gets 78 when 79 and above gets 0 and 73-78 gets A. More serious will be the mark 39 when 40 is the pass mark (say). These can be tackled from an approach of probabilities (Misra, Taylor, Tluanga). We may take some precautions to avoid them. The university could have all papers which are "bare misses" at any grade level marked again by different examiners or this might be done only for those who are just below the passing mark.
Refer to Appendix K

6 Since grading is not suitable for a selection situation, how useful can it be in university examination ?

This doubt springs from the confusion between selection and achievement. University examinations in all subjects by and large are *achievement* examinations and *not selection* type examinations. In classifying achievement, it is more meaningful to use grading system (which

recognises the errors in measurement and accounts for it). It is not all argued that grading is suitable in selection type (say UPSC) examinations.

7. Some employers and those who admit students for postgraduate study may feel that it will be impossible to choose one amongst many who obtained A.

Let us be very clear about it. These students who all obtained. As are all equal and nothing more, nothing less. Separate tests and other procedures specially designed to evaluate the suitability of candidates must be designed and adopted. An alternative will be to think of an overall grade point average for the course correct to two decimals. This will differentiate between students of the same grade in a finer manner to enable selection of a few restricted, as amongst many who got A. It is time that employer and those who admit students for postgraduate study begin to think in terms of special testing and aptitude testing respectively.

8. Grading system does not allow ranking of candidates.

Candidates are ranked only. With the use of normative standards, grades are given. It is true that among those who are graded with equal grades, there is no distinction.

9. Award of medals and prizes calls for communication of the names of students obtaining the highest marks.

Grade point average can help and certainly other procedures must be devised to select the best among those who had the same grade point average. The probability of the same grade point average to the second decimal occurring more than once is very low. It is time that suitable scientific selection procedures are devised and achievement and selection are not mixed up any more.

10. Various appointing authorities want grades to translated into at least percentage of marks. This adds to the work of the university.

This is not a problem in the interim transition period when marks are converted into grades with the help of normative standard tables. After a few years when teachers and examiners get used to the grading system, the meaning of different grades would be familiar to everyone then. The

problem is similar to the one faced by us when the metric system was introduced.

11. Candidates seeking admission in foreign universities were asked to submit the actual marks secured by them. For students going abroad for their studies, the Reserve Bank of India requires submission of marks obtained by each student applicant before releasing foreign exchange. Grades need not be converted into marks. Grade point average along with the current normative table may be made available for such cases.

12. Several other universities have not adopted the grading system ; considerable difficulty will be experienced by the alumni of a university to obtain admission to those universities.

There are two alternatives : If grading is accepted by all universities in the country or at least by a group of universities in a region, then uniformity can be attempted by adopting say the 7 point scale. The other alternatives will be to use grade point average and suitable admission tests.

13. In regard to professional examinations the grades were translated into the minimum marks in that grade and students who got more marks than the minimum reckoned, were at a disadvantage. This was particularly done by Madras and Kerala universities when they tried grading for a few years and gave up later.

This was wrong. Transformations from grade to marks are meaningful only with respect to a *range* of marks for a particular grade.

14. Some colleges are academically superior. Over many years nearly 80 to 90% of their students have been obtaining first divisions. And there are a few colleges where not even 1% of their students obtain first divisions. Will not the better college be put to difficulties while the bad ones profit from the new system?

Since the examiner is going to mark the papers a majority of students from the better college will obtain marks in the higher ranges and therefore good grades. Once the normative table for a subject is prepared, then ranges of marks and grades' columns only will be used. However, it is better (and preferable) to randomise scripts and it is recommended that

the Gauhati method of using random number table be adopted by all universities. Once this is done, each set of papers (randomised) will have the same sort of distribution as used in the construction of normative table.

15. Since the students know that each one's grade will be relative to the performance of others, is it not possible that they may by common consent slacken their pace of study and lower standards?

It is not, as long as man is propelled by a spirit of competition, even inside a college there will be students who strive to excel over others. All the more so in a university, where it is unimaginable that *all* students should consent not to study hard.

16. How do we determine column 3 (range of marks) in the nomative table?

This the university must decide. The decision involves first what proportion of students should pass the examination. The tables given in this monograph show around 90% which is much higher than what obtains in the present setup-as I think it ought to be. The university must adjust this as it deems fit. Again the university has to decide the proportions who shall attain the various grade levels. Then it should continue to use the distribution upon which it has decided. This grade distribution is a kind of "academic currency" that must retain a generally stable value. Adjustments may be made, however if and when the university has solid evidence from other sources (not from examinations) that the general ability level of students has changed.

17. Are the procedures of scaling marks and translating them into grades too complex, too technical, to be workable?

No statistical expertise is required to develop and use this kind of grading scale.

18. Many vice-chancellors feel that there is added strain in the controller's office and that examiners are to be given training in grading of answer papers.

It was amply demonstrated by the Project Officer (Examinations) of AIU that normative standard tables for different subjects from the results of the last 3 years of the University of Madras, can be constructed easily within an hour per subject. It is however suggested that in examinations (PUC) where nearly a lakh of students appear, a random 10% sample may be taken and table constructed.

Once the table is constructed, it is available for use and only slight modification is required to update it every year.

A computer programme can be written to generate the tables from results and also for updating the tables. (A few universities have already started using computers in their examinations and others are on their way.)

As far as the training of examiners in grading is concerned, it is absolutely essential that one-day workshops on grading answers be conducted by individual universities with the expert guidance of UGC/AIU and other bodies.

19. Will it be more advantageous for a group of universities, perhaps those in a region, to think about such a problem together, reach an agreement and act together ?

Even though all Indian universities should come together and solve such problems at least those in the region should try to come together and introduce uniformity. In a similar way question banking, internal assessment etc. could be tackled.

20. Why this predilection for seven grades ? Why not more or fewer ?

The decision is necessary somewhat arbitrary To use 7 categories is definitely better than using 101. But 7 is not a magic number. The most commonly used grading scale in educationally developed countries (USA, UK, Sweden, Germany) is the 5 point scale.

5 point scale GCEA level in UK

UGC Plan '73 (grades 1, 2, 3, 4, 5 meaning outstanding, very good, good, fair and poor)

7 point scale International Baccaulaureate Examination
(A and B grades into A1, A2, B1 and B2)
9 point scale A.E.T. Barrow
W.H. Hill
(adopted in India at the JNTU, Hyderabad)

The UGC Zonal Workshop on Examination Reform 1975 recommended that "The main consideration to be borne in mind in choosing a particular scale should be that it conforms to the distinctions that teachers and examiners usually bear in mind when classifying a group of students." Now, teachers ordinarily think of a student as excellent (outstanding), very good, good, average, below average, poor, very poor. This indicates the normality of a 7 point scale.

The limitation of a 5 point scale is that it is not suitable for such purposes as the award of fellowships, since it does not give finer discriminations. To quote Dandekar, "Two sets of marks which agree in respect of candidates falling in each of these 5 classes will have patterns of distribution which are similar for all practical purposes. If a closer agreement is desired, we may split up some of the 5 classes mentioned above and obtain say 7 or 9 classes. Two sets of marks agreeing in respect of the proportions of candidates falling in each of the 7 classes will evidently agree in their pattern of distributions even more closely and if they agree in respect of 9 such classes, the agreement will be all the more close. It is howver recommended that a group of teachers can come to a decision regarding the points in the grade system."

Note : Ugc 7 point scale. Teachers can mark the examination scripts as at present in terms of numerical marks. The numerical marks can be then translated to grades Award O (outstanding) to the top mark and F the fail mark and distribute the remaining marks between O and F on the basis of equal intervals.

For example maximum marks in a subject is 77 ; minimum marks is 36.

71-77 O
64-70 A
57-63 B
50-56 C

43-49 D
36-42 E
<36 F

Similar tables may be constructed for each subject or paper.

In case it is found that some departments or colleges are overestimating or underestimating the performance of their students in internal assessment or external examinations, this can be test checked by means of the normal distribution curve or frequency distribution curve or frequency distribution of marks in the earlier years by a central agency.

Normal Distribution (UGC) : A 7%
B 24%
C 38%
D 24%
E 7%

There is a consensus in respect of the points of scale to be adopted. After considerable discussions, all the workshops (Delhi, Chandigarh, Bombay and Madras) convened by UGC during October-December, 1975 have accepted to adopt the 7 point scale. But the recommendation to divide the range between maximum and minimum marks awarded equally to denote different grades suffers from serious disadvantages :

(a) The equal range of marks for different grades is unjustifiable rationally and scientifically.

(b) Considering minimum marks (usually ones around 35) for each subject is arbitrary.

The discrepancies on adopting equal marks intervals for different grades are brought out in the table below, which gives a comparison of marks to grades conversion by both methods.

| S.No. | Percentage of candidates | Actual range of marks | Range of marks on equal marks intervals | |
|---|---|---|---|---|
| 1. | 3% (4 students) | 79 and above | O 74-81 | 12 students |
| 2. | 7% (11 students) | 73-78 | A 66-73 | 33 students |
| 3. | 22% (33 students) | 65-72 | B 58-65 | 45 students |
| 4. | 36% (65 students) | 53-64 | C 50-57 | 30 students |
| 5. | 22% (38 students) | 40-52 | D 42-49 | 23 students |
| 6. | 7% (11 students) | 32-39 | E 34-41 | 15 students |
| 7. | 3% (5 students) | 31 | F 34 | 9 students |
| | 167 students | | | 167 students |

The above Table has been constructed based on the actual examination results of 167 students who appeared for their M.Sc. (Physics) Quantum Mechanics paper. The top 3% (4 students) had marks more than 79; the next 7% (11 students) had marks in the range of 73-78.

Adopting the UGC method of equal marks interval for grade categories, $\left(\frac{81-35}{6}\right)$ 8 marks interval decides a grades 74-81 to give O, 66-73 to give A & so on. Looking to these range of marks, the number of students obtaining these are found out. They 12, 33, 45, 30, 23, 15 and 9 students. This means that 12 students get an O by UGC method while only 4 students will get it by the other method. 30 students get an average grade C by UGC method, while 65 students get average by the other method. The number of students who score grades of good, very good & out standing is 90 by UGC method & only 48 by the other method. It is true that the UGC method *overgrades.** The Research Cell, AIU, has just completed an illuminative research project in the design of a sound grading system and the results are being published in a Report.

## APPENDIX A

## SCALING

If different sets of marks are to be added or to be compared they need to be scaled to a common standard where such standard is lacking. It is lacking when

(a) a student's mark in one subject is added to his marks in other subjects to arrive at an aggregate mark ;
(b) the answer books of students are marked by different examiners ;
(c) marks derived from internal assessment are combined with marks on university examinations.

When we consider marks awarded by different examiners, we need first to know which marks ought to scaled. When on examiner given higher mark than another, it is either because he was marking the answer books of better students or standard of marking was more lenient. Which of these is the true reason? We have got to know that before we can apply any corrective measures. Here comes in the need to randomise the answer books before they are given to examiners for valuing. When randomising is done in a through way, it ensures that all examiners are

* Refer to Appendix J where the later UGC recommendation to keep passing mark as the lower limit of D (instead of E as given earlier) is used. Still UGC method involves over grading

making batches of answer books that are equivalent in quality. We can be reasonably sure that differences in the marks of examiners should be attributed to their different standards of marking, not to the quality of answer books.

Converting Raw Scores into Derived Scores

Examination scores can be expressed by comparison with an absolute standard, inter-individual comparison or intra individual comparison.

Comparison with an "absolute standard" can be

1. Percentage correct scores
2. Letter grades

Inter-individual comparison can be:

| Based on Mean Standard diviation | Based on Rank within groups | Based on range of scores in a group |
|---|---|---|
| (i) Z scores | (i) Ranks and bands | (i) Percent placement |
| (ii) T scores | (ii) Percentile ranks | |
| (iii) AGCT scores | (iii) Letter grades | |
| (iv) CEEB scores | (iv) Normalised standard scores | |
| | (a) T scaled score | |
| | (b) Stanine score | |
| | (c) C scaled score | |

.Intra-individual comparison can be

1. Ratio IQS
2. Intellectual status index.

Since most of our examinations involve inter-individual comparsion, we ought to know the various methods of converting raw scores to derived scores to make them more meaningful. The Z score is basic to all other derived scores based on mean and standard deviation. Z score tells in

simple terms the difference (or distance) between a stated group's mean and any specified raw score value

$$Z = \frac{x - \bar{x}}{s.d}$$ Where $x$ = a specified raw score

$\bar{x}$ = Mean of scores

s.d. = standard deviation of scores

T score corresponding to a raw score = $10Z + 50$ where Z = Z score ; AGCT (Army General Classification Test) score = $20Z + 100$ ; CEEB = $100Z + 500$ (College Entrance Exam. Board Score). Table 1 and Table 2 show these derived scores for objective type test and essay examination. Based on rank within groups, percentile rank is a person's relative position within a group. Table 3 indicates a method of finding percentile ranks when the distribution of raw marks is skewed and different from normal distribution, T scaled score is preferred. It is shown elsewhere

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Natrajan, V. On a Correlation between Micro and Macro Teaching assessments of Student Teachers', Teacher Education Vol. X No. 2, Jan. 1976.

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that T scaled score is not all superior to T score and that considering the time and effort spent to find T scaled score in relation to T score, T score itself is adequate. Percent placement score indicates a person's position on a 101 point scale where the highest score made is set at 100 and the lowest at 0.

$$\% \text{ placement} = \frac{100\,(X - L)}{(H - L)}$$

X = Any raw score

L = Lowest raw score

H = Highest raw score

Of these percentile ranks seem to be the best derived score for inter-individual comparison. T score offer a similar advantage. With T scores.

1. The original distribution is not altered but linearly transformed.
2. Scores in different subjects can be added.
3. Standards over successive years in subjects can be set and maintained.
4. There is provision for correcting boosted up distribution of marks.

TABLE I

| S.No | Marks (x) | Frequency (f) | xf | $x^2$ | $fx^2$ | $(x-\bar{x})$ | Z Score $\frac{(x-\bar{x})}{S.D.}$ | 10y+50 | T Score | AGCT | CEEB | Percentile Rank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 4 | 72 | 224 | 1296 | + 5.1 | 1.82 | 68.2 | 68 | 136 | 680 | 98 |
| 2 | 17 | 3 | 51 | 289 | 867 | + 4.1 | 1.48 | 64.8 | 65 | 130 | 650 | 93 |
| 3 | 16 | 6 | 96 | 256 | 1536 | + 3.1 | 1.10 | 61.0 | 61 | 122 | 610 | 87 |
| 4 | 15 | 11 | 165 | 255 | 2475 | + 2.1 | 0.74 | 57.4 | 57 | 114 | 570 | 76 |
| 5 | 14 | 9 | 126 | 196 | 1764 | + 1.1 | 0.39 | 53.9 | 54 | 108 | 540 | 63 |
| 6 | 13 | 9 | 117 | 169 | 1521 | + 0.1 | 0.03 | 50.3 | 50 | 103 | 500 | 51 |
| 7 | 12 | 8 | 96 | 144 | 1152 | − 0.9 | − 0.33 | 46.7 | 47 | 94 | 470 | 40 |
| 8 | 11 | 11 | 121 | 121 | 1331 | − 1.9 | − 0.68 | 43.2 | 43 | 86 | 430 | 27 |
| 9 | 10 | 5 | 50 | 100 | 500 | − 2.9 | − 1.02 | 39.8 | 40 | 80 | 400 | 17 |
| 10 | 9 | 6 | 54 | 81 | 486 | − 3.9 | − 1.40 | 36.0 | 36 | 72 | 360 | 9 |
| 11 | 8 | 2 | 16 | 64 | 128 | − 4.9 | − 1.76 | 32.4 | 32 | 64 | 320 | 4 |
| 12 | 7 | 1 | 7 | 49 | 49 | − 5.9 | − 2.15 | 28.5 | 29 | 58 | 290 | 2 |
| 13 | 6 | 1 | 6 | 36 | 36 | − 6.9 | − 2.50 | 25.0 | 25 | 50 | 250 | 1 |
| | | $\Sigma = 76$ | $\Sigma = 977$ | | $\Sigma = 13141$ | | | | | | | |

$$\text{Mean } \bar{x} = \frac{\Sigma xf}{\Sigma f} = \frac{977}{76} = 12.85 \approx 12.9$$

$$\text{s.d.} = \sqrt{\frac{\Sigma f x^2}{N} - \left(\frac{\Sigma xf}{N}\right)^2}$$

$$\sqrt{\frac{13141}{76} - (12.85)^2} = \sqrt{172.8 - 165.1}$$

$$= \sqrt{7.7}$$

$$= 2.77$$

1. SE Mean $= \frac{sd}{\sqrt{n-1}} = \frac{2.77}{\sqrt{75}} = 0.12$

Mean $= 12.85$

$-0.12 \qquad + 0.12$

$= 12.73 \qquad 12.97$

2. IME = Index of Measurement Efficicncy

$$= 1 - \frac{0.16\,k}{\sigma^2}; \ \sigma^2 = (sd)^2; \ k = \text{no. of items}$$

$\sigma$ = s.d,

$$= 1 - \frac{0.16 \times 20}{7.7} = 1 - \frac{3.2}{7.7} = \frac{4.5}{7.7} = 0.584$$

3. SE Measurement $= sd\sqrt{1-r}$

$= 2.77\sqrt{1-0.584}$

$= 2.77\sqrt{0.416}$

$= 2.77 \times 0.61 = 1.69$

TABLE 2

| S.N. | Marks (x) | Frequency (f) | (xf) | $(x-\bar{x})$ | $(x-\bar{x})f$ | Z Score | T Score | AGCT Score | CEEB Score | Percentile Ranks | T Scaled Score |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 84 | 4 | 336 | 121 | 484 | + 1.1 | 61 | 122 | 610 | 90 | 62.5 |
| 2 | 80 | 3 | 240 | · 49 | 147 | + 0.7 | 57 | 114 | 570 | 73 | 56.0 |
| 3 | 76 | 3 | 228 | 9 | 27 | + 0.3 | 53 | 106 | 530 | 58 | 52.0 |
| 4 | 72 | 2 | 144 | 1 | 2 | + 0.0 | 50 | 100 | 500 | 45 | 49.0 |
| 5 | 68 | 5 | 340 | 25 | 125 | — 0.4 | 46 | 92 | 460 | 28 | 44.0 |
| 6 | 56 | 2 | 112 | 289 | 578 | — 1.6 | 34 | 68 | 340 | 10 | 37.0 |
| 7 | 52 | 1 | 52 | 441 | 441 | — 2 0 | 30 | 60 | 300 | 3 | 30.0 |
| | | $\Sigma=20$ | $\Sigma=1452$ | | $\Sigma=1804$ | | | | | | |

$$\bar{x} = 145/20 = 72.6 = 73$$

$$\text{S. E.}_{\text{MEAN}} = \frac{SD}{\sqrt{n-1}} = \frac{9.5}{\sqrt{19}} = 2.18$$

$$\text{Variance} = 1804/20 = 90\ 2$$

$$Sd = \sqrt{90.2} = 9.5$$

TABLE 3

| S No. | Mark x | Frequency f | cf | $cf_m$ | $CCP_m$ | P.R. |
|---|---|---|---|---|---|---|
| 1 | 18 | 4 | 76 | 74.0 | 97.5 | 98 |
| 2 | 17 | 3 | 72 | 70.5 | 93.0 | 93 |
| 3 | 16 | 6 | 69 | 66.0 | 87.0 | 87 |
| 4 | 15 | 11 | 63 | 57.5 | 76.0 | 76 |
| 5 | 14 | 9 | 52 | 47.5 | 62.5 | 63 |
| 6 | 13 | 9 | 43 | 38.5 | 50 8 | 51 |
| 7 | 12 | 8 | 34 | 30.0 | 39.5 | 40 |
| 8 | 11 | 11 | 26 | 20.5 | 27.0 | 27 |
| 9 | 10 | 5 | 15 | 12.5 | 16 6 | 17 |
| 10 | 9 | 6 | 10 | 7.0 | 9.2 | 9 |
| 11 | 8 | 2 | 4 | 3 0 | 3.95 | 4 |
| 12 | 7 | 1 | 2 | 1.5 | 1.98 | 2 |
| 13 | 6 | 1 | 1 | 0.5 | 0.66 | 1 |

cf Cumulative frequency
$cf_m$ Cumulative frequency of midpoint
$CP_m$ Cumulative percentage of midpoint
P.R. Percentile Rank

## ERROR IN MARKING & SOURCES OF ERROR

Let us consider the obtained or raw marks of 5 individuals. Let it be possible for us to estimate the error in these raw marks, so that their true marks are also possible to obtain on this basis. If we make a statistical analysis of these sets of scores (obtained or raw score ; error score and true score) in terms of mean, variance etc., we find that

$V_o = V_t + V_e$; $V_t/V_o = 1 - \frac{V_e}{V_o} = r$ (reliability coefficient)

Standard error of measurement $= \sqrt{V_e}$
$V_o$ = Variance of observed scores
$V_t$ = Variance of true scores
$V_e$ = Variance of error scores

| S.No. | Student | Obtained Score | Error Score | True Score |
|---|---|---|---|---|
| 1 | A | 16 | −2 | 18 |
| 2 | B | 10 | +1 | 9 |
| 3 | C | 17 | +2 | 15 |
| 4 | D | 22 | +1 | 21 |
| 5 | E | 10 | −2 | 12 |
| | Mean | 15 | 0 | 15 |
| | Variance | 20.8 | 2.8 | 18.0 |

Reliability = 18/20.8 = 0.865; SE Measurement = $\sqrt{2.8} = 1.67$

Applying McMorris formula $r = (1 - \frac{0.16k}{\sigma 2})$, we obtain reliability coefficient of the test

$$= 1 - \frac{0.16 \times 25}{20.8} = 1 - \frac{4.00}{20.8} = \frac{16.8}{20.8}$$

If we multiply by $\frac{k}{k-1}$ i.e. $\frac{25}{24}$; $r = \frac{16.8}{20.8} \times \frac{25}{24} = 0.85$

SE measurement = $Sd \sqrt{1-r}$

$$= \sqrt{20.8} \sqrt{1-85} = \sqrt{20.8} \times \sqrt{0.15}$$

$$= \sqrt{3.02} = 1.72$$

The effect of error variance $V_E$ (low reliability) is to introduce an uncertainty (standard error) into any mark allotment. This reduces the ability of the test to discriminate between students of differing attainment. If this inability of a test (of low reliability) to make fine discriminations is ignored, use of observed scores in classifying students will become a spurious activity. In order to improve the reliability, it is necessary to bring down error variance to the extent possible.

There are many sources of error variance. Some of them are:

(*a*) *Subjectivity in marking*

One of the greatest problems facing the examination Boards in their use of essay examinations, is the problem of getting the student's answers accurately marked. Equally competent markers looking at a student's answer come up with different marks and worse still to the same student's answer on different occasions This is entirely due to subjective judgement in marking. Taylor[11] demonstrated that their examiners marking 45 candidates in PU examination in 1962 agreed in their marks in 4.8% of cases; differed by 5 marks in 69% of cases and differed by 10 marks or more in 33% of cases. Harper[12] has brought out the discrepancies in 90 members

12 Taylor, H.J. Operation pass mark. Gauhati University, 1963.

13 Harper, A. Edwin Jr. "Ninety Marking Ten—A study of examinations", Indian Education Review, vol. 2, 1967.

marking 10 history scripts. The author[14] through an exercise in marking

14 Natarajan, V. An Exercise in Marking, Workshop on Evaluation for College Teachers, AIACHE, Madras 1975.

(an eighth grade arithmetic problem) amply demonstrated that equally competent examiners differed considerably in their marking the same student's answer (range from O out of 10 to 9 out of 10 ; mean around 5.6 ; s.d. = 2.4 to 2.7).

(b) *Error due to biassed sampling of topics*

Any test or examination is only a sample of a universe of questions that can be asked. The sample must be representative. Variations in observed scores will result if the sampling is defective. The remedy seems to be sampling the subject with a table of specifications and/or testing the whole subject usually by objective type tests.

(c) *Error due to biassed sampling of abilities*

Variations in observed scores will result if abilities are not properly sampled in relation to teaching. This error can be minimised by a table of specifications.

(d) *Error due to allowing student a choice of questions*

Supposing a test or examination permits students to choose 5 out of 10. There are 252 ways of doing this i.e. 252 different tests or examinations that have been taken. This variation produces variation in test scores unrelated to their true variation in attainment.

Harper[15] showed that a paper that requires students to answer 5 out

15 Harper, A. Edwin Jr. "Chance in the Traditional Examinations", Journal of Education and Psychology, vol. 20, 1962.

of 9 questions can be considered a fair test for only 135 out of 1000 students. Singha[16] has analysed the total implications on study habits,

16 Singha, H.S. Choice in Examinations. New Fronties in Education, AIACHE, New Delhi.

selective examining, unreliable comparability etc. very well.

(e) *Error due to arbitrary time limits*

In examinations, the introduction of a time limit introduces a variation in observed scores which is not related to a variation in their attainment. This is minimised by pretesting to find the optimum required time-a typical procedure if we adopt question/item banks.

(f) *Error due to assumptions in addition of marks*

In adding individual marks to obtain a final test score for one student, it is assumed that marks are of equal weight and scale. These assumptions are invariably false and lead to variations in observed scores. This is minimised by ensuring that each mark is equal in weight and that each mark awarded correlates with the final test score to give linear vector addition. This check (discrimination) index is quite common with objective type tests.

All these things culminate into an error in marking and this error variance gives us a clear picture of observed scores. If universities/examination boards in our country at all levels take steps to indicate along with raw marks in each subject for a student details like mean, standard deviation, reliability coefficient and error in measurement, there will then be no need for any treatment of observed scores.

## Appendix C

## GRADING

Reporting the results of university examinations or of internal assessment or of a combination of the two in terms of a grading scale instead of the familiar marking scale is not widely advocated in India but support for it is growing. For example a Committee of the Central Advisory

Board of Education[17] has said that for all public examinations, "the result

17 Central Advisory Board of Education. Report of the Committee on Examinations, New Delhi, NCERT, 1971.

should be declared subjectwise and furnished in the form of grades ; the raw marks given by the examiners should never made available."

Transforming marks into a smaller number of grades, each grade representing a range of marks would give us a more dependable differentiation among the students. A grading scale does not attempt to make such fine distinctions as envisaged by 101 point marking and therefore it is less misleading. It groups students into a smaller number of categories representing a range of marks and we can be more confident that the range within which a student is placed gives an accurate indication of his standing. It is usual to make this range correspond to twice the standard error of measurement/for example refer to Table I, if SE Measurement is rounded off to 2 marks

| | | | |
|---|---|---|---|
| 16 | to | 20 | A |
| 12 | to | 15 | B |
| 8 | to | 11 | C |
| <8 | | | D |

Several grading scales have been advocated, from time to time.

1. *Assuming a normal distribution* This is possible in public examinations of a huge number of students who are heterogenic.

| Letter grade | Point grade | Percent of population | Classification |
|---|---|---|---|
| A | 1 | 7% | Outstanding |
| B | 2 | 24% | Very good |
| C | 3 | 38% | Good |
| D | 4 | 24% | Fair |
| E | 5 | 5% | Poor |

In this system, E grade is a poor grade and not a fail.

2. *City and Guilds*

| | | |
|---|---|---|
| 80 | to 90% | A |
| 60 | to 70% | B |
| 50 | to 60% | C |
| 40 | to 50% | D |
| <40% | | E |

3. *Dressel and Nelson*

| | |
|---|---|
| A | 0 to 15% |
| B | Next 20 to 30% |
| C | 40 to 50% |
| D | 10 to 20% |
| E | 0 to 1% |

4. *Stanford*

| | |
|---|---|
| A | 15% |
| B | 35% |
| C | 35% |
| D | 10 to 15% |
| E | 0 to 5% |

5. *Wood*

| | |
|---|---|
| A | 9 to 12% |
| B | 26 to 12% |
| C | 26 to 28% |
| D | 30 to 44% |
| E | 9 to 4% |

6. *Moury & Berg*

| | |
|---|---|
| A (average + 2 average deviation) and above | 5% |
| B (average + 2/3 average diviation) and above | 25% |
| C (average − 2/3 over deviation) and above | 40% |
| D (average − 2 over deviation) and above | 25% |
| E | 5% |

7. *Dandekar*

| Range of Marks | Percent of population | Grade No. | | |
|---|---|---|---|---|
| 80 & above | 2% | 1 | $A_1$ | Very good |
| 70 to 79 | 8% | 2 | $A_2$ | |
| 63 to 69 | 10% | 3 | $B_1$ | |
| 59 to 62 | 14% | 4 | $B_2$ | Above average |
| 55 to 58 | 16% | 5 | $C_1$ | |

| | | | |
|---|---|---|---|
| 50 to 54 | 20% | 6 | $C_2$ Average |
| 45 to 49 | 10% | 7 | $D_1$ Below average |
| 40 to 44 | 10% | 8 | $D_2$ Pass |
| 39 & below | 10% | 9 | F Fail |

8. *Duggal*

| | | |
|---|---|---|
| A | Excellent | 4 |
| B | Good | 3 |
| C | Fair | 2 |
| D | Pass | 1 |
| F | Fair | 0 |

9. *Based on Z score*

Z score + 1.0 → A

− 1.0 to 1.0 → B

< − 1.0 → C

\+ 1.5 → A

1.0 to 1.5 → B

0 to 1.0 } → C

−1.0 to 0 }

−1.0 to −1.5 → D

> − 1.5 → E

10. *Based on percentile ranks*

| | |
|---|---|
| 90% above | A |
| 65% to 90% | B |
| 30% to 65% | C |
| 10% to 20% | D |
| | E or F |

100 (101 point Scale) 0

(3 point Scale)

| Outstanding | Average | Very poor |
|---|---|---|

(5 point Scale)

| Outstanding | Above average | Average | Below average | Very poor |
|---|---|---|---|---|

(7 point Scale)

| Outstanding | Very good | Good | Average | Below average | Poor | Very poor |
|---|---|---|---|---|---|---|
| O | A | B | C | D | E | F |

## APPENDIX D

## NORMATIVE STANDARD TABLES

**M.Sc. (Physics)** — QUANTUM MECHANICS (100 *Marks*)

| S. No. | Percentage of candidates | Range of marks (1975) | |
|---|---|---|---|
| 1 | 3% ( 4 students) | 79 & above | O |
| 2 | 7% (11 students) | 73-78 | A |
| 3 | 22% (33 students) | 65-72 | B |
| 4 | 36% (65 students) | 53-64 | C |
| 5 | 22% (38 students) | 40-52 | D |
| 6 | 7% (11 students) | 32-39 | E |
| 7 | 3% (5 students) | < 31 | F |

**M.A. (Economics)** — MONETARY & INTERNATIONAL ECONOMICS (200 *Marks*)

| S. No. | Percentage of candidate | Range of marks 1975 | 1974 | 1973 | Average range of Marks |
|---|---|---|---|---|---|
| 1 | 3% | 114 & above | 119 & above | 123 & above | 119 & above |
| 2 | 7% | 109-113 | 112-118 | 117-122 | 113-118 |
| 3 | 22% | 100-108 | 100-111 | 106-116 | 102-112 |
| 4 | 36% | 85-99 | 85-99 | 91-105 | 87-101 |
| 5 | 22% | 65-84 | 63-84 | 79-90 | 69-86 |
| 6 | 7% | 44-64 | 45-62 | 69-78 | 53-68 |
| 7 | 3% | < 43 | < 45 | < 69 | < 52 |

**M.A. (Philosophy)** — COMPULSORY ESSAY (175 *Marks*)

| S. No. | Letter grade | Percentage of candidates | 1975 | 1974 | 1973 | Average range of marks |
|---|---|---|---|---|---|---|
| 1 | O | 3% | 113-123 | 104-117 | 111-113 | 109-118 |
| 2 | A | 7% | 98-112 | 93-103 | 100-105 | 97-108 |
| 3 | B | 22% | 93-97 | 87-92 | 89-99 | 89-96 |
| 4 | C | 36% | 80-92 | 78-96 | 74-88 | 77-88 |
| 5 | D | 22% | 73-79 | 70-77 | 65-73 | 68-76 |
| 6 | E | 7% | 58-63 | 66-69 | 48-64 | 54-67 |
| 7 | F | 3% | < 53 | < 60 | < 48 | < 49 |

**M.Com.** MANAGEMENT ACCOUNTANCY & FINANCIAL CONTROL (175 *Marks*)

| S. No. | Percentage of candidates | Range of marks 1975 | |
|---|---|---|---|
| 1 | 3% ( 7 students) | 115 & above | O |
| 2 | 7% (18 students) | 105-114 | A |
| 3 | 22% (55 students) | 94-104 | B |
| 4 | 36% (95 students) | 79-93 | C |
| 5 | 22% (55 students) | 70-78 | D |
| 6 | 7% (18 students) | 57-69 | E |
| 7 | 3% ( 6 students) | < 55 | F |

**(MSc. Zoology)** ANIMAL PHILOSOPHY (120 *Marks*)

| S. No. | Percentage of candidates | Range of marks 1975 | |
|---|---|---|---|
| 1 | 3% ( 1 student) | 73 & above | O |
| 2 | 7% (10 students) | 71-72 | A |
| 3 | 22% (21 students) | 68-70 | B |
| 4 | 36% (32 students) | 65-67 | C |
| 5 | 22% (25 students) | 61-64 | D |
| 6 | 7% ( 7 students) | 59-60 | E |
| 7 | 3% ( 2 students) | 44-58 | F |

Appendix E

**PRESENT POSITION OF GRADING IN UNIVERSITIES** (Compiled by UGC)

1. *Agra University*

The University has decided to introduce a system of grading on a 7 point scale.

2. *Aligarh Muslim University*

The matter of assessing the performance of students at the examination in the form of grades has been accepted in principle by the Academic Council and the measure is to be implemented.

3. *Andhra University*

The University has not given any thought to the problem of having grades in place of marks, except that in the B. E./B. Tech. degree course, 5 point letter grading has been adopted.

4. *Andhra Pradesh Agricultural University*

The final grading of the students is done in letter grades viz., A, B, C, D, and F. The signficance of each grade and the points which it carries are as below:

| % of marks obtained | Grade | Significance | Points |
|---|---|---|---|
| 90-100 | A | Excellent | 4 |
| 80-89 | B | Good | 3 |
| 70-79 | C | Fair | 2 |
| 60-69 | D | Pass but not Satisfactory | 1 |
| < 60 | F | Failed | 0 |

5. *Banaras Hindu University*

The University has decided to adopt the following system of grading 'in principle'.

6. *Bombay University*

The University has decided to adopt the following System.

That the system of grading be introduced and that necessary modification be made to the regulations relating to the award of scholarships, prizes and medals at the various examinations. That the system of awarding grades be introduced for assessment of the performance of the candidates in practicals in the subjects of Physics, Chemistry and Biology at the intermediate science examination in place of marks as at present.

7. *Calicut University*

The University is willing to introduce a system of grading if simultaneous change is made in all the Universities in the State and region.

8. *Govind Ballabh Pant University of Agriculture and Technology, Pantnagar*

There are several tests in each course during a trimester. The evaluation of answers is in terms of marks. At the end of the trimester the marks obtained in a course in the various tests are aggregated and converted into grades on the following basis:

| Range of marks | Grade | Meaning | | Numerical value of the grade |
|---|---|---|---|---|
| | | Under-Graduate | Post Graduate | |
| 80% or above | A | Excellent | Excellent | 5 |
| 70-79% | B | Good | Good | 4 |
| 60-69% | C | Fair | Fair | 3 |
| 50-59% | D | Poor, barely pass | Failure | 2 |
| 50% | F | Failure | -- | 1 |

9. *Gujarat University*

The University has decided to introduce the system of grading in the faculty of engineering.

10. *Indira Kala Sangeet Vishwavidyalaya, Khairagarh*

The committee appointed by the University has recommended that the present system of marking may continue.

11. *Jawaharlal Nehru University, New Delhi*

The University has adopted the semester system. The students are examined in every course from time to time throughout the semester and at the end of each semester. The teacher grades the students on the results of various kinds of tests, home assignments, special projects etc. on the following 10 point scale.

| Grading : | $A_+$ | A | $A_-$ | $B_+$ | B | $B_-$ | $C_+$ | C | $C_-$ | F |
|---|---|---|---|---|---|---|---|---|---|---|
| Numerical value: | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

Each course is weighted by credit based on contact hours. In courses having sessional evaluation as well as end semester examinations each evaluation carries equal weightage and the grade in a course is arrived at

by taking into account the grades in sessional as well as end-semester examination. In courses not having end-semester examination the sessional evaluation carries full weightage.

While it is not possible to work out exact equivalence between the letter grade and the numerical marks, the grades from A+ to A— may be comparable to first class and grades B+ to B— to second class.

12. *Jawaharlal Nehru Technological University, Hyderabad*

The University has adopted 9 point scale grading. Based on the raw score of the candidate, grades are awarded as indicated in the table given below :

| Marks | Letter grade | Grade points |
|---|---|---|
| 91-100 | A+ | 10 |
| 81- 90 | A | 9 |
| 71- 80 | A— | 8 |
| 61- 70 | B+ | 7 |
| 51- 60 | B | 6 |
| 41- 50 | B— | 5 |
| 31- 40 | C | 4 |
| 21- 30 | D | 3 |
| 11- 20 | E | 2 |

13. *Jadavpur University*

The faculty of engineering and technology has recommended introduction of grades in place of marks on the following system :

| Grades | Classification | Grade point |
|---|---|---|
| A | Excellent | 5 |
| B | Very good | 4 |
| C | Good | 3 |
| D | Fair | 2 |
| E | Unsatisfactory | 0 |

14. *Meerut University*

Grading has not been introduced yet. Only in one faculty i.e. faculty of education it has been recently passed by the Board of Studies and the faculty that grading be introduced

15. *M.S. University of Baroda*

A grading system based on either 5 point scale or 11 point scale is in use in the four faculties where the semester and the internal assessment system is in operation. In other faculties the numerical marks system is in vogue.

16. *Mysore University*

System of grading was in practice for only M.Sc. (Food Technology) but now the final result is announced in terms of classes.

17. *Orissa University of Agriculture and Technology, Bhubaneswar*

The University has a system of grading on a 4 point scale.

18. *Osmania University*

The various heads of departments of the University are of unanimous opinin that the present system of marking be continued instead of the grading system suggested in the UGC report. However, the University has already introduced grade system in the faculty of technology on an experimental basis.

91. *Panjab University*

The University has decided to introduce a 4 or 5 point grading system in place of the present system of evaluation.

20. *Panjab Agricultural University, Ludhiana*

The Academic Council at its 45th meeting, while considering the recommendations of the postgraduate committees, approved the following formula for inter-conversion of OGPA and aggregate percentage of marks under the traditional system of examinations, for the postgraduate students.

$$Y = 59.96 - 28.31 x + 8.33x^2$$

Y represents the percentage of marks in the traditional system and X represents the grade point average.

| Overall grade point average on 4.00 basis | Equivalent with percentage of marks |
|---|---|
| 3.00 | 50.00 |
| 3.10 | 52.25 |
| 3.20 | 54.66 |
| 3.30 | 57.25 |
| 3.40 | 60.00 |
| 3.50 | 62.92 |
| 3.60 | 66.00 |
| 3.70 | 69 25 |
| 3.80 | 72.67 |
| 3.90 | 76.25 |
| 4.00 | 80.00 (or above) |

21. *Poona University*

The University has accepted the system of grading. The scale of conversion into a grade from marks for different subjects in the faculties will naturally vary. The scale is being specified by the Boards of studies, indicating what each grade stands for.

22. *Roorkee University*

The introduction of grading system has been considered by the University but no decision has been arrived at for its adoption at present.

23. *Sambalpur University*

Grading in lieu of numerical marking is under consideration.

24. *Sardar Patel University*

It has been decided to introduce letter grade and grade point average system in respect of all examinations (except preparatory level) from the current academic year 1975-76. The evaluation will be made on the 5 point scale. In addition to the letter grade, percentage of aggregate marks upto two decimal points will be shown in the mark-sheet to be issued by the University.

25. *Saugar University*

For the purpose of assessment, there shall be a 5 point scale of letter grades and the degree of performance connected by each letter may be given a numerical value for the purpose of computing a cumulative grade point average (CGPA) as follows :

| Letter grade | Performance in the course | Numerical grade points |
|---|---|---|
| A | Outstanding | 10 |
| B | Very good | 8 |
| C | Good | 6 |
| D | Fair | 4 |
| E | Poor | 2 |

26. *Udaipur University*

Grading system has been introduced in the agricultural wing. The final grade in each course is determined by the teachers concerned by combining the marks given in three one-hour tests and the final semester examination. The final grading of the student is done in alphabets. Each course carries certain points. The significance of each grade point is as under :

For undergraduates :

| Grade | Points per Cr. Hour | Significance |
|---|---|---|
| A | 4 | Excellent |
| B | 3 | Good |
| C | 2 | Fair |
| D | 1 | Pass but not satisfactory |
| F | 0 | Fail |
| I | — | Incomplete |
| W | — | Withdrawn |
| NC | — | Non-credit course |
| P | — | Progress (for projects only) |

For postgraduates :

| Grade | Points per Cr. Hour | Significance |
|---|---|---|
| A | 4 | Excellent |
| B | 3 | Good |
| C | 2 | Fair |
| F | 0 | Fail |
| I | — | Incomplete |
| W | — | Withdrawn |
| R | — | Repeated |
| SR | — | Satisfactory |
| US | — | Unsatisfactory |
| NC | — | Non-credit course |

27. *Sri Venkateswara Unievrsity*

The university is considering the question of introducing grading.

**Institutions Deemed to be Universities**

28. *Birla Institute of Science and Technology, Pilani*

The Institute has adopted the system of letter grading. There are 5 regular letter grades. Each grade connotes the degree of performance and has a numerical value for purposes of performance and has a numerical value for purposes of computing cumulative grade point average (CGPA).

29. *Central Institute of English and Foreign Languages, Hyderabad*

The scale of marks has been replaced by the system of letter grades A, B, C, D, and E (failure).

30. *Indian Institute of Science, Bangalore*

The Institute assigns grades on a point scale (A, B, C, D and E) and also works out the grade point average of the students.

31 *Indian School of Mines, Dhanbad*

The question of introducing a system of grading is under consideration.

32. *Tata Institute of Social Sciences, Bombay*

The Institute gave up the grading system 10 years ago as it did not function successfully.

33. *Indian Institute of Technology, Delhi*

The Institute follows the following system of grading:
Undergraduate examinations:

| | |
|---|---|
| E | 80% and above |
| A | 70-80 |
| B | 60-70 |
| C | 50-60 |
| D | 40-50 |
| $F^1$ | 30-40 |
| $F^2$ | Below 30 |

M. Tech. and Postgraduate diploma:

| Grade | Qualitative description | Grade point |
|---|---|---|
| A | Excellent | 4 |
| B | Good | 3 |
| C | Average | 2 |
| D | Poor | 1 |
| I | Incomplete | |
| W | Withdrawn | |

The minimum grade point average is 2.25 for the first semester.
Subdivision of grades in the undergraduate examinations:

| | |
|---|---|
| $A^1$ | 75-80 |
| $A^2$ | 70-75 |
| $B^1$ | 65-70 |
| $B^2$ | 60-65 |

34. *Indian Institute of Technology, Kanpur*

The Institute follows a 5 point letter grading scale. The qualitative description and the grade points attached to each letter grade are as follows:

| Grade | Qualitative description | Grade point |
|---|---|---|
| A | Excellent | 10 |
| B | Good | 08 |
| C | Fair | 06 |
| D | Marginal pass | 04 |
| F | Fail | 02 |

**Additional Note**

At the fourth and final Workshop on Grading held at the University of Madras under the auspices of the UGC on Dec. 22-23, 1975, all the Southern region universities decided to introduce a 7 point scale system of grading first of all for the PG Examinations from 1976-77 and then for Undergraduate examinations from 1977-78.

Accordingly the University of Madras devised a system of grading on 7 point scale system based on UGC method of equal interval mark scale of conversion from marks to Grades. A detailed note on Grading was prepared and circulated and also three, 2 day training programmes for training PG teachers in Grading were held.

Table below shows the conversion of marks to grades in different subject areas to be adopted by Madras University.

**TABLE OF GRADES**

Worked out on the basis of highest average marks in the subjects for 3-4 years with the minimum of 35% as suggested by the UGC.

| Grades | Points | Mathematics | Statistics | Physics | History Economics & Philosophy | English & Tamil |
|---|---|---|---|---|---|---|
| O = out standing | 6 | 75 and above | 67 and above | 63 and above | 55 and above | 59 and above |
| A = Very Good | 5 | 65-74 | 59-66 | 56-62 | 50-54 | 53-58 |
| B = Good | 4 | 55-64 | 51-58 | 49-55 | 45-49 | 47-52 |
| C = Average | 3 | 45-54 | 43-50 | 42-48 | 40-41 | 41-46 |
| D = Below Average | 2 | 35-44 | 35-42 | 35-41 | 35-39 | 35-40 |
| E = Poor | 1 | 25-34 | 25-34 | 25-34 | 25-34 | 25-34 |
| F = Very Poor | 0 | 0-24 | 0-24 | 0-24 | 0-24 | 0-24 |

## APPENDIX F

### A SYSTEM OF GRADING OF RESTRUCTURED EXAMINATIONS WITH OBJECTIVE & SUBJECTIVE QUESTIONS

Some Universites[1] as a part of implementation of Examination Reform Plan[2] circulated by the University Grant Commission, have reconstructed the pattren of their question papers in various subjects and many other Universites[3] are on their way to implement restructured pattern of question papers.

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1. *Madras, Madurai, Osmania, Andhra*
2. *Examination Reform--A plan of Action July' 76 University Grants Commission.*
3. *Calicut, Mysore, Gauhati, Rajasthan Annamalai*

---

Nearly 40 Universities in the country are adopting 7 point scale Grading System,first of all in their Post Graduate examinations and a year later in undergraduate examinations also. In most of the cases, the restructuring of their question papers is in the form of

| | |
|---|---|
| Part A | Objective type questions (constant alternatives, Multiple Choice/ Multiple facet, Matching and Rearrangement types) |
| Part B | Short answer questions (simple question Short answer, Short problems ) |
| Part C | Long answer question. |

Invariably Part A will have 30 Multiple choice questions, Part B 10 short answer questions and one essay question in Part C. Part A will carry 30 marks and for 30 minutes; Part B, 50 marks for 120 minutes and Part C, 20 marks for 30 minutes. An important feature of such a restructured pattern is that compared to present practice, it increases the number of questions to be answered by the students quite significantly. With forty odd questions, it is possible to cover the entire syllabus adequately and to include all the important objcetives which is simply not possible when a student answers five or six questions. The content validity of such a restructured paper is pretty high and the general overall reliability very much improved. There is better objectivity in the paper generally. The accepted 7 point scale grading system in various Universities in the country is as follows :

| | | *Points* |
|---|---|---|
| O | Outstanding | 6 |
| A | very good | 5 |
| B | good | 4 |
| C | average | 3 |
| D | below average | 2 |
| E | poor | 1 |
| F | very poor | 0 |

Most of the Universities have decided to adopt 'direct grading' Madurai University has even developed in a few subjects models of answers of diffrent grade catagories to

a single question. Some Universities have also decided to continue with the percent marking and then convert these marks into grades with the help of Normative Standard Tables prepared one each for each subject based on the results of the last 3 years of students in the same subject.

4. 'Monograph on Grading for Universities', Association of Indian Universities, 1976.

Two distinct methods of conversion have emerged, one is suggested by University Grants Commission and the other by the Association of Indian Universities[6].

5. Examination Reform - A Plan of Action, ..... '76.
6. Monograph on Grading for Universities, Association of Indian Universities, second revised edition..... September 76.

A comparison of these two methods in respect of undergraduate examinations of a University has been made and it is concluded that while the University Grants Commission method is simple, it involves over grading to varying degrees while the Association of Indian Universities method is a bit complicated but it does not involve overgrading. It is strongly felt that such an arrangement for conversion of marks to grades is only a transitory arrangement and that within a couple of years, Universities operating a grading system will do well to switch over to 'direct grading'. A system of grading such a restructured examination with objective and subjective questions; is given here. The method suggested is quite practicable and can be handled by either controller's unit or special Examination Units in these Universities. In many cases, it will be necessary to have a recourse to a digital computer.

## 2.0 SYSTEM OF GRADING

Let us take that a typical restructured paper in a subject consists of

| | | | | |
|---|---|---|---|---|
| Part A | Objective type items | 30 Nos. | 30 Max. Marks | 30 Mts. |
| Part B | Short Answer type questions | 10 " | 50 " | 120 " |
| Part C | Long answer type questions | 1 " | 20 " | 30 " |
| | Total | 41 " | 100 " | 180 " |

There may be variations in the number of questions, marks allotted and times set apart, in respect of different subjects. The method proposed can be still applied in all such cases

Parts A, B, and C are to be answered by students separately and marked or graded by examiners also separately.

It is suggested that Part A be marked with respect to marks and Part B and Part C question-wise graded. This is because Part A consists of items which have one and only one predetermined correct answer and that a student's answer to an item is either right or wrong and further that he can be given either 1 or 0 marks accordingly. Let us take that all answers of all students to Part A be marked and and assembled and certain statistical calculations be done quickly namely Mean of Marks, Standard Deviation: It is also possible to analyse for each item; its facility value and discimination index. Similarly for Part B; questionwise grading can be adopted, as well for Part C.

A typical student may return the following :

Part A:

| Item No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Marks Obtained | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |

Cont'd...

| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |

* Total 21/30

Part B:

| Question No: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Grades Obtained | O | A | A | B | A | B | B | C | B | B |

*Questions are all of equal weight

mination index. Similarly for Part B, questionwise grading can be adopted, as well for Part C.

A typical student may return the following :

Part A :

| Item No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Marks Obtained | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |

| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | |

• Total 21/30

Part B : •

| Question No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Grades Obtained | 0 | A | A | B | A | B | B | C | B | B |

• Questions are all of equal weight

Part C :

| Question No. | 1 |
|---|---|
| Grade awarded | B |

The question is 'what is the overall grade to this student in Parts A, B and C put together'?

'What is the grade point average'?

'What are the relative weights of these Parts?

Part A The student has obtained 21/30. This means that a grade is to be allotted to this mark. In order to do this, let us take that the full range 0-30 marks is made use of and that the Mean, Standard Deviation are calculated from the marks in *Part A* of all students. This is likely to be around 15 for Mean and about 4 marks for Standard Division. Even of the reliablity of this Part is around 0.9, the SEM is $0.3 \times 4 = 1.2$ marks.

A conversion from marks to grades to this Part A can be:

| | |
|---|---|
| 27 and above | O outstanding |
| 24 – 26 | A very good |
| 21 – 23 | B good |
| 18 – 20 | C average |
| 15 – 17 | D below average |
| 12 – 14 | E poor |
| < 12 | F very poor |

On this basis, the student (21/30) obtains a B.

An alternative (equally good) will be to mark all students in Part A and arrange them in a rank order : the top 3% may be given an O; the next 7% an A and so on.

| | |
|---|---|
| 3% | O outstanding |
| 7% | A very good |
| 22% | B good |
| 36% | C average |
| 22% | D below average |
| 7% | E poor |
| 3% | F very poor |

This is particularly uesful when dealing with *large numbers* and also scripts have been *randomized*. It is very likely that this student will obtain a B here also.

Part B The same student obtains questionwise grades as follows,

| Question No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Grades obtained | 0 | A | A | B | A | B | B | C | B | B |

The overall grade point average for Part B. is

$$\frac{6 + 5 + 5 + 4 + 5 + 4 + 4 + 3 + 4 + 4}{10} = \frac{44}{10} = 4.40 \rightarrow \text{B}.$$

If Part B consists of 10 questions of varying weights or credits, then the entry & GPA calculation will be as under:

Part B

| Question No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Grade | 0 | A | A | B | A | B | B | C | B | B |
| Grade points | 6 | 5 | 5 | 4 | 5 | 4 | 4 | 3 | 4 | 4 |
| Weights | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 |
| Grade pts X weights | 6 | 10 | 10 | 4 | 10 | 4 | 4 | 6 | 8 | 4 |

Total (Grade pts X weights) = 66

$$\text{Weighted GPA} = \frac{66}{\text{Sum of weight}} = \frac{66}{15} = 4.40 \rightarrow \text{B}.$$

Part C The student has obtained a B already by direct grading. It may be necessary to combine the grades individually obtained in Parts A, B and C into an *overall grade* for the student.

## 3.00 OVERALL GRADE CALCULATION :

The student under consideration obtained in Part A 21/30 ; this on conversion became a B ; in Part B an overall grade of B(4.40) and a grade of B in Part C.

It is usual to take the relative weightages of Part A, Part B and Part C to be dependent on the maximum marks of these parts i.e. 30:50:20. If one wants to get the true weightages of these parts taking into consideration the ranges of mark-grade in these, then they can be calculated as suggested by Nuttall[7].

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7. Nuttall, The CSF Investigations, British Examination - techniques of Analysis, NFER 72

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This method of course will require all parts to be marked and standard deviations of all individual parts obtained:

$$\text{Weightages of one part} = \frac{\text{Standard deviation of that Part} \times 100}{\text{Sum of the standard deviations of all parts}}$$

Let us take the weightages to be 3:5:2 for these parts A, B and C.

Then the overall grade point average is

$$\frac{3 \times 4.0 + 5 \times 4.40 + 2 \times 4.0}{10} = \frac{12+22+8}{10} = \frac{42}{10} = 4.20 \text{ (B)}$$

4.0 CONCLUSIONS:

In calculating the overall grade in an examination paper having a restructured pattern of Part A objective type items, Part B short answer questions and Part C long answer questions, Part B and Part C are straight forward while Part A needs certain interpretation and convert marks to grades in Part A. An advantage of this method is that this can be applied to any combination of Part A, Part B and part C.

APPENDIX G

FACING SHEET OF AN ANSWER BOOK

TITLE OF EXAMINATION.....

SUBJECT OF EXAMINATION.....

| | | | |
|---|---|---|---|
| PART A | 30 ITEMS | OBJECTIVE TYPE | 30 MINUTES/30 MARKS |
| PART B | 15 QUESTIONS | SHORT ANSWER | 120 MINUTES/50 MARKS |
| PART C | 1 QUESTION | LONG ANSWER | 30 MINUTES/20 MARKS |

PART A WEIGHT [3]

| ITEM NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARK | | | | | | | | | | | | | | | |

| ITEM NUMBER | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARK | | | | | | | | | | | | | | | |

TOTAL [ ] OUT OF [30]

GRADE [ ]

PART B WEIGHT [5]

| QUESTION NUMBER | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRADE | | | | | | | | | | | | | | | |

GRADE [ ]

PART C WEIGHT 2

| QUESTION NUMBER | 1 | 2 | 3 |
|---|---|---|---|
| GRADE | | | |

OVERALL GRADE

| | | |
|---|---|---|
| PART A | GRADE | WEIGHT |
| PART B | GRADE | WEIGHT |
| PART C | GRADE | WEIGHT |

To convert marks to grades for PART A

Either use a Table

| | | | |
|---|---|---|---|
| 27 and above | O | Outstanding | (6) |
| 24 – 26 | A | Very good | (5) |
| 21 – 23 | B | Good | (4) |
| 18 – 20 | C | Average | (3) |
| 15 – 17 | D | Below average | (2) |
| 12 – 14 | E | Poor | (1) |
| 12 | F | Very poor | (0) |

(or)

Marks all the answers of all students to *Part A* and arrange them in a rank order

| | |
|---|---|
| Award to the top 3% | O Outstanding |
| next 7% | A Very good |
| next 22% | B Good |
| next 36% | C Average |
| next 22% | D Below average |
| next 7% | E Poor |
| and the last 3% | F Very poor |

Appendix F has already indicated a system of grading restructured examination papers.

Where Part B consists of questions of unequal weights, a table for Part B as given in Appendix F must be adopted for the facing sheet.

## APPENDIX J

### COMPARATIVE STUDY OF NORMATIVE STANDARD TABLE METHOD, UGC METHOD & Z SCORE METHOD FOR CONVERSION OF MARKS TO GRADES

SUMMARY BASED ON 7 POINT SCALE GRADING SYSTEM

(Delhi/Madras University Results)

| SUBJECTS | PERCENTAGES OF CANDIDATE BELONGING TO THE CATEGORY | | | | | |
|---|---|---|---|---|---|---|
| | Good & above | Average | Good & above | Average | Good & above | Average |
| | Modified Normal | | UGC | | Based on Z Score | |
| *Post Graduate* | | | | | | |
| 1. Mathematics | 29 | 42 | 51 | 20 | 29 | 39 |
| 2. Economics | 36 | 32 | 57 | 14 | 36 | 32 |
| 3. History | 34 | 34 | 78 | 13 | 34 | 36 |
| 4. Psychology | 30 | 39 | 78 | 18 | 30 | 39 |
| 5. Commerce | 40 | 37 | 48 | 38 | 36 | 32 |
| *Under Graduate* | | | | | | |
| 1. Mathematics | 33 | 35 | 43 | 18 | 33 | 35 |
| 2. Zoology | 34 | 37 | 52 | 28 | 33 | 37 |
| 3. Psychology | 37 | 34 | 68 | 19 | 37 | 34 |
| 4. Botany | 40 | 36 | 63 | 22 | 33 | 36 |
| 5. Physics | 28 | 33 | 45 | 35 | 31 | 37 |
| 6. Chemistry | 36 | 29 | 56 | 25 | 31 | 40 |

## ILLUSTRATION TO SHOW THAT UGC METHOD OF CONVERSION OF MARKS TO GRADES INVOLVES OVERGRADING COMPARED TO NORMATIVE STANDARD TABLE METHOD (AIU) AND RATIONAL METHOD BASED ON Z SCORES

SAMPLE USED Marks of 83 candidates at M.A. (Hindi) Examination of Ranch University in 1974.

Mark frequency of these 83 candidates is shown below:

| Mark | Frequency | Mark | Frequency | Mark | Frequency |
|---|---|---|---|---|---|
| 60 | 2 | 50 | 2 | 36 | 2 |
| 58 | 2 | 48 | 3 | 35 | 2 |
| 57 | 2 | 47 | 1 | 34 | 6 |
| 56 | 1 | 46 | 3 | 31 | 1 |
| 55 | 3 | 45 | 5 | 30 | 2 |
| 54 | 3 | 44 | 4 | 29 | 2 |
| 53 | 1 | 42 | 3 | 25 | 1 |
| 52 | 3 | 40 | 1 | 12 | 1 |
| 51 | 7 | 39 | 2 | 10 | 1 |
| | | 38 | 4 | 7 | 1 |
| | | 37 | 5 | 6 | 1 |
| | | | | | = 83 |

Normative Standard Table

| | | | | | | |
|---|---|---|---|---|---|---|
| O | Outstanding | 3% of 83 | = 2.49 | 2 students | 60 and above |
| A | Very good | 7% of 83 | = 5.81 | 5 students | 56 – 58 |
| B | Good | 22% of 83 | = 18.26 | 17 students | 51 – 55 |
| C | Average | 36% of 83 | = 29.88 | 30 students | 39 – 50 |
| D | Below average | 22% of 83 | = 18.26 | 19 students | 34 – 38 |
| E | Poor | 7% of 83 | = 5.81 | 5 students | 29 – 33 |
| F | Very poor | 3% of 83 | = 2.49 | 5 students | 28 |

UGC Method Highest Mark = 60
Passing Minimum = 35
Interval = 60 – 35 = 25 marks

If 35 marks is kept as the bottom limit of D, (below average point) then there are 5 intervals, each of which is made of 5 marks

| | | |
|---|---|---|
| O | Outstanding | (56 – 60) |
| A | Very good | (51 – 55) |
| B | Good | (46 – 50) |
| C | Average | (41 – 45) |
| D | Below average | (36 – 40) |
| E | Poor | (31 – 35) |
| F | Very poor | 30 |

Number of students in these categories are

| | | |
|---|---|---|
| O | (56 – 60) | 7 |
| A | (51 – 55) | 17 |
| B | (46 – 50) | 9 |
| C | (41 – 45) | 12 |
| D | (36 – 40) | 18 |
| E | (31 – 35) | 9 |
| F | ( 30 ) | 9 |

The corresponding figures by Normative Standard Table method are

O – 2
A – 5
B – 17
C – 30
D – 19
E – 5
F – 5

It can be easily seen that UGC method involves OVER GRADING.

## APPENDIX K

### GRADING BORDERLINE CASES

The method outlined here is the original thinking of Dr. Edwin Harper Jr., Director, Bureau of Educational Research, Ewing Christian College, Allahabad. An Illustrative example is given below.
Referring to Appendix J

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | | | 40 | | 50 | | | | 60 | |
| | 29 | | 34 | | 39 | | | 51 | 56 | 58 | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | | E | | D | | C | | B | | A | | O |
| 5 | | 5 | | 19 | | 30 | | 17 | | 5 | | 2 |
| | 1 | | 6 | | 6 | | 4 | | 4 | | | |
| | 1 | | 1 | | 7 | | 7 | | 1 | | 1 | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | EF | E | DE | D | CD | C | BC | B | AB | A | OA | O |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | EF | E | DE | D | CD | C | BC | B | AB | A | OA | O |
| 4 | 2 | 3 | 7 | 7 | 13 | 16 | 11 | 9 | 5 | 3 | 1 | 2 |

## APPENDIX L

## SUMMARY OF RECOMMENDATIONS MADE TO VARIOUS UNIVERSITIES/OTHER BODIES IN RESPECT OF GRADING

Many workshops on Grading were arranged and conducted in various universities during the year and at the end of deliberations with University teachers, certain recommendations were made in respect of implementation of grading system for PG and UG examinations. These are given below:

1. A 7 point scale grading system as defined below may be introduced for all PG examinations to start with from academic year 1976-77 and for all UG examinations one year later

O Outstanding
A Very good
B Good
C Average
D Below average
E Poor
F Very poor

2. 'Direct Grading, may be adopted wherever possible. This is possible in the case of papers containing short answer, problem solving, and long answer question. In the case of objective type questions, first marking shall be done and marks converted into grades with the help of a table as detailed out in Appendix F. Direct Grading is also possible in the case of many components of internal assessment like Quiz, Home assignments, Tutorial, Lab./Field/Practical work, Projects, Discussion/Seminar, Interest/Attitude rating scales etc. A design of answer book facing sheet may be done as in Appendix G. Direct Grading is also essential when numbers of students involved are small say below 100.

3. During the transition period, if it is desired, marking can be continued, marks may be converted into Grades with the help of Normative Standard Tables. These tables have to be constructed one for each subject taking into account a number of past years' perfomances of students to provide a *stable* and *dependable* standard. The percentages to be adopted are given

O 3%
A 7%
B 22%
C 36%
D 22%
E 7%
F 3%

It is important that the population should be fairly large (say 100 to a few thousand) and also randomization of scripts is done if a number of markers is involved.

4. The UGC method conversion of marks to grades taking the interval of marks between highest mark awarded and pass minimum (kept at the bottom limit of D) distributed equally to the five grade categories of O, A, B, C, & D definitely provides an *OVER GRADING* Ref. Appendix J.

5. Along with grades obtained in every, paper the grade point average (GPA) be also indicated. In the case of questions of unequal weights, weighted Grade point average may be given.

6. Grades in internal assessment and end examinations may be shown separately.

7. There shall be no award of classes or divisions.

8. Degrees may be conferred to those obtaining the grade not below 'C' in individual papers or subjects. In the alternative, a combined overall GPA of 3.00 is necessary for award of a degree with a minimum GPA in every subject of 2.50. Different universities may set different levels.

9. Students may be allowed to improve their grades in subjects they choose to.

10. The university may set up an Appeals Committee for each college to hear any appeal preferred by students against evaluation of internal assessment grades. The Committee may consist of (a) the Principal of the college, (b) the Head of Department of the subject concerned and (c) an expert in the subject invited from a local college or college nearby. A detailed procedure for appeal may also be given.